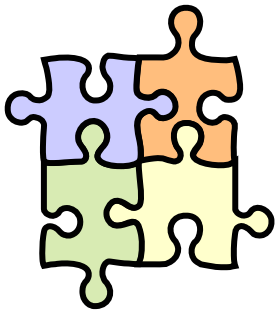
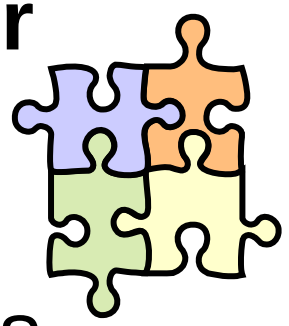
# Long Term Sustainment of Digital Information for Science and Engineering

## Putting the Pieces Together





March 24-25, 2007

National Institute of Standards and Technology

# What is “sustainment”?

From *The Free Dictionary:*

- **Noun -** the act of sustaining life by food or providing a means of subsistence; "they were in want of sustenance"; "fishing was their main sustainment“
- **Transitive verb**
  - **1.** To keep in existence; maintain.
  - **2.** To supply with necessities or nourishment; provide for.
  - **3.** To support from below; keep from falling or sinking; prop.
  - **4.** To support the spirits, vitality, or resolution of; encourage.
  - **5.** To bear up under; withstand: can't sustain the blistering heat.
  - **6.** To experience or suffer: sustained a fatal injury.
  - **7.** To affirm the validity of: The judge has sustained the prosecutor's objection.
  - **8.** To prove or corroborate; confirm.
  - **9.** To keep up (a joke or assumed role, for example) competently.

# Sustaining digital information

- Minimal
  - “Prop up”
  - Prevent destruction
- Better
  - Preserve
  - Ensure authenticity, availability
- Ideal
  - Nurture
  - “Care and feeding”
  - Enable reuse

# The organizers

- NIST Manufacturing Engineering Lab
  - Josh Lubell
  - Sudarsan Rachuri
  - Eswaran (Sub) Subrahmanian
- Drexel University Computer Science Dept.
  - Bill Regli

# Genesis of this workshop

- Bill Regli realized NIST Manufacturing Engineering Lab, Drexel Univ. and Nat'l Nuclear Security Admin. Kansas City Plant all working on similar projects
- August 2005 meeting
  - NIST
  - Drexel University
  - Kansas City Plant
  - National Archives
  - Library of Congress

# Observations from that meeting

- This area of interest mainly to manufacturers and archivists, not engineers at large
- The perfect is the enemy of the good enough
  - KCP saves CAD data + TIFF image + STEP file
- We (manufacturing community) are asking the same kinds of questions as other groups such as medical, space science
  - Architecture, packaging, scalability important across the board
- Concentrating on archive management while ignoring ingest and access is dangerous
- What's the difference between archiving and product data exchange?
  - Added dimension of time

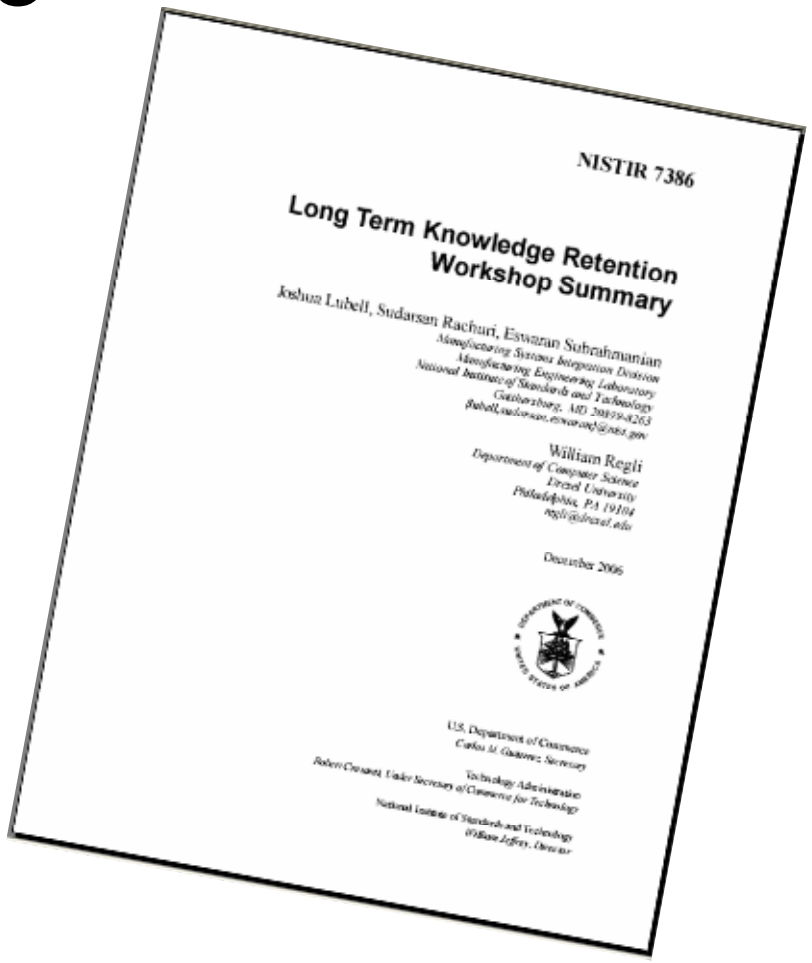
# LTKR NIST WORKSHOP 2006

Themes

- View of long-term knowledge retention as an archiving process
- Emphasis on business case development.

Issues

- Lack of support & understanding of LTKR in the engineering community
- Economic model needed to rationalize archiving
- Lack of formal methods and standards for long term retention of engineering knowledge
- Uncertainty in the utility of the archived data, inefficient archival procedures
- Clear policy guidelines and cost-benefit models needed



NISTIR 7386

**Long Term Knowledge Retention Workshop Summary**

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December 2006

U.S. Department of Commerce
Carlos M. Gutierrez, Secretary

Technology Administration
Robert Cresanti, Under Secretary of Commerce for Technology

National Institute of Standards and Technology
William Jeffrey, Director

# LTKR II – University of Bath, February 2007

- More on this from Chris McMahon...

# Digital preservation metrics

- Library of Congress digital format sustainability factors
  - Disclosure
  - Adoption
  - Transparency
  - Self-documentation
  - External dependencies
  - Impact of patents
  - Technical protection mechanisms
- What are the sustainability factors for an archiving strategy?

# Goals of Long Term Sustainment workshop

- Evaluate relevant technologies
  - Semantic modeling
  - Digital preservation
  - Distributed information management
- Key objectives
  - Predict future effectiveness of a proposed preservation solution
  - Determine optimal combination of technologies for achieving success at reasonable cost

# Agenda

- Invited speakers
  - Chris McMahon, University of Bath
  - Mike Smorul, University of Maryland Institute for Advanced Computer Studies
  - Kate Zwaard, US Government Printing Office
- Breakout groups
  - Implementation and technology focus
  - Standards and domain focus
  - More from Sudarsan...

# Administrivia

- Schedule changes
- Breaks, lunch, restrooms
- Location of breakouts
- Emergency exit
- Access to buildings on campus